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relieve European nations, particularly Germany, of their excess of silver.

The closing paper was also by Professor Elliott, upon electric lighting, giving the results of an examination of the system in use in the Philadelphia post-office. The system is the Weston; the incandescent lights employing an electro-motive force of 73.75 volts, and the arc lights a current of 80.05 amperes. One effective horse-power of the engine was required for 13.25 incandescent lights, and for 1.43 arc lights. One horse-power on the incandescent circuit gave a light equal to 237 standard candles, and on the arc-light circuit of 1,077.3 candles. In remarking upon these results, a member called attention to the low electro-motive force employed, and pointed out that this largely increased the safety of the system as compared with others.

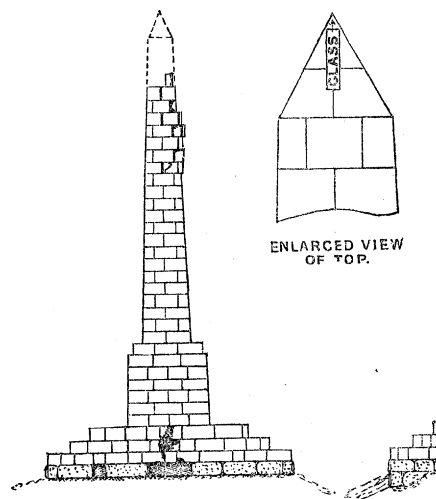
### NOTES AND NEWS.

THE officers elected for the next meeting of the American association for the advancement of science, which will be held in Buffalo, commencing Aug. 18, 1886, are: president, Prof. Edward S. Morse of Salem, Mass.; section **A**, mathematics and astronomy, vice-president, Prof. J. Willard Gibbs of Yale College, New Haven, Conn.; secretary, Mr. S. C. Chandler, jun., of the Harvard observatory, Cambridge, Mass.; **B**, physics, vice-president, Prof. C. F. Brackett of the College of New Jersey, Princeton, N.J.; secretary, Prof. H. S. Carhart of the North-western university, Evanston, Ill.; **C**, chemistry, vice-president, Dr. H. W. Wiley of the department of agriculture, Washington, D.C.; secretary, Professor William McMurtrie of the Illinois industrial university, Champaign, Ill.; **D**, mechanical science and engineering, vice-president, Mr. O. Chanute of Kansas City, Mo.; secretary, Mr. William Kent of Jersey City, N.J.; **E**, geology and geography, vice-president, Prof. T. C. Chamberlin of the U. S. geological survey, Beloit, Wis.; secretary, Prof. E. W. Claypole of Buchtel college, Akron, O.; **F**, biology, vice-president, Dr. Henry P. Bowditch of the Harvard medical school, Boston, Mass.; secretary, Mr. J. C. Arthur of the N.Y. experiment station, Geneva, N.Y.; **H**, anthropology, vice-president, Mr. Horatio Hale of Clinton, Ont.; secretary, Mr. A. W. Butler of Brookville, Ind.; **I**, economic science and statistics, vice-president, Mr. Joseph Cummings of Evanston, Ill.; secretary, Mr. H. E. Alvord of Houghton Farm, Mountainville, N.Y. No nominations were made for section **G**, histology and microscopy, as it has been decided to merge it in the biological section. The permanent secretary is Mr. F. W. Putnam of the Peabody museum, Cambridge, Mass.; the general secretary, Prof. S. G. Williams of Cornell university, Ithaca, N.Y.; the assistant secretary, Prof. W. H. Pettee of the University of Michigan, Ann Arbor; and the treasurer, Mr. William Lilly of Mauch Chunk, Penn.

— The Germans hold the fifty-eighth meeting of their association of naturalists and physicists this year at Strassburg, Sept. 17-23.

— The Anthropological congress, which is shortly to be held at Rome, will have a curious feature in a collection of 700 skulls of criminals, numbered and classified. To these, says *Nature*, will be added the photographs of 3,000, and the brains of more than 150 convicts; thousands of autographs, poems, sketches, and special instruments, the work of criminals; an album containing a record of 700 observations, physical and moral, on 500 criminals, and on 300 ordinary men. There will also be graphic maps of crime in Europe, with reference to meteorology, food, institutions, suicide, etc.; tables of the stature of criminals in relation to the length of the arms, and of crime in towns compared to that in the country. Mr. Bertillon will exhibit the graphic curves of 23,000 *recidivistes* examined in twelve parts of the body, and the practical results obtained. Photographs of Russian political and other criminals, especially of those from Moscow, and wax masks of a large number of celebrated criminals, will also be exhibited. All the notabilities in the science of criminal anthropology will take part in the congress.

— On the 28th of April, 1884, during a very severe thunder-storm, the monument of the first duke of Sutherland at Lilleshall, Shropshire, Eng., was struck and badly injured by lightning. Mr. C. C. Walker, who was near by during the storm, made a careful study of the monument and its surroundings, the results of which are published in the *Quarterly journal*



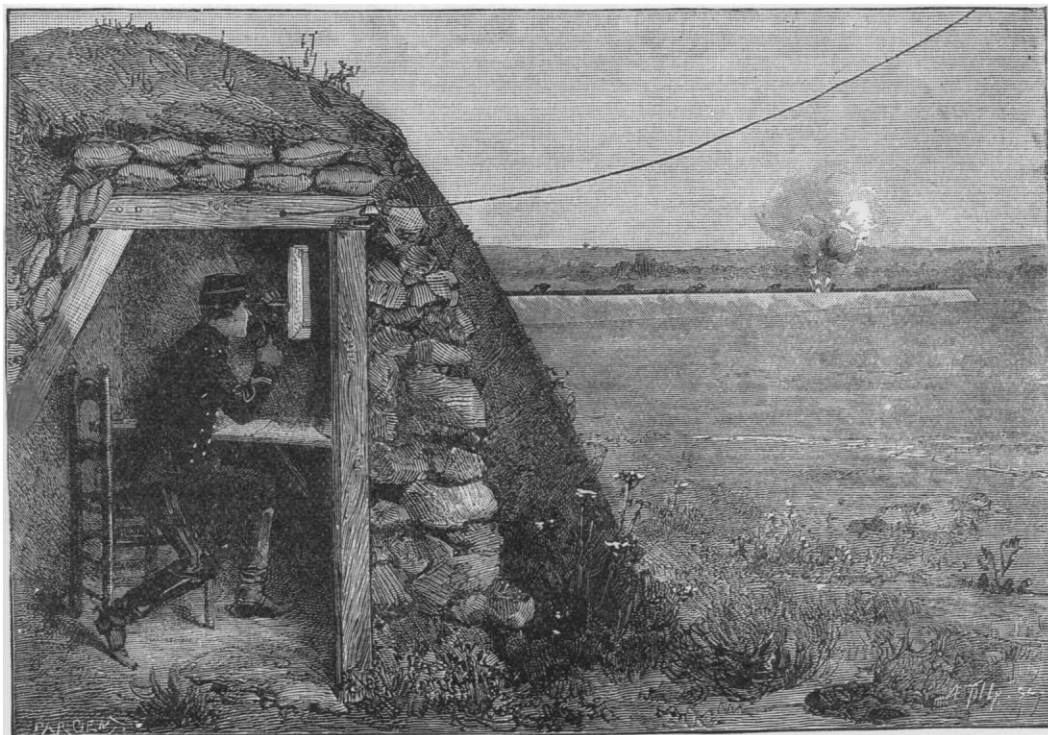
ENLARGED VIEW  
OF TOP.

of the Royal meteorological society (January, 1885). The monument stands two hundred feet above the surrounding country, and is built of sandstone in the form of an obelisk. In 1839, six years after its erection, it was so severely damaged by lightning that it had to be taken down and rebuilt. The builder, ignorant of electrical science, fixed on the top, as the apex of the shaft, a pyramid of glass eight inches square at the base, and also inserted pieces of plate-glass six inches wide and thirty inches in length, in grooves cut in the sides of the shaft, thinking, no

doubt, that this, being a non-conductor, would prevent a repetition of the accident of 1839. The accident which occurred in 1884 completely destroyed the upper ten feet of the obelisk; and the next nine courses of stone for about fifteen feet were all displaced, and pushed out from the central axis, and were in danger of falling. The platform was broken by the falling stones, large stones on the circumference of the platform displaced, and some of the faces of the sides forced out altogether. The sod round the base of the monument was ploughed up in fifteen grooves three to six inches wide and ten to seventy feet in length, while the grass was scorched brown.

Mr. Chandler proposes for future adoption — as the rounded tenth probably nearest the true value of the latitude of the dome of Harvard-college observatory,  $42^{\circ} 22' 47.6''$ , in place of the value  $48.3''$  given in the *American ephemeris*, and  $48.1''$  given in the *Berlin jahrbuch* and the *Connaissance des temps*.

—In *La lumière électrique* for April 18, Mr. B. Marynovitch has a long article upon the telephone used as a signal instrument. The early part of the article is devoted largely to telephone calls, and to the telephone used as a railway signal. At the conclusion of the article, some attention is paid to the use of the telephone for military purposes; and we here



—Mr. S. C. Chandler, jun., has published in the *Astronomische nachrichten* a most interesting series of observations, — made with his newly devised instrument, the almucantar, — to determine the latitude of Harvard-college observatory. His results confirm the fact that the hitherto accepted value of the latitude requires a sensible correction. The new instrument gives results remarkably accordant among themselves, the latitude deduced from a set of seventy-three observations being  $42^{\circ} 22' 47.57'' \pm 0.028''$ . Rediscussing, in the light of more recent determinations of the star positions, the old observations made by the Bonds and Major Graham in 1844–45, and by Gould at the Cloverden observatory in 1855, and combining these with observations of his own in 1883–85,

reproduce one of the illustrations showing an officer seated in a casemate observing the effect of shot upon a target near by. He is supplied with a telephone, by means of which he transmits the results to the battery.

—We have received a papyrographed circular announcing the 'American economic association,' whose objects are stated to be the encouragement of economic research, the publication of economic monographs, the encouragement of perfect freedom in all economic discussion, and the establishment of a bureau of information. To this statement of the objects of the association is appended a proposed 'platform,' of which the first plank expresses ardent opposition to the doctrine of *laissez-faire*; the second

asserts the belief that political economy is still in the first stages of its scientific development, for the accomplishment of which it must rely chiefly on the study of statistics and history; the third holds that the host of social problems which have arisen through the conflict of labor and capital cannot be solved without 'the united efforts of church, state, and science;' and the fourth disclaims all partisanship in questions of governmental policy, and especially in that of free trade and protection. We understand that the meeting for organization was planned to be held this week at Saratoga, during the session of the American historical association just closed, and was to be of a private character, the participants being those who have been invited by the initiators of the movement. The association is designed to be of an academic rather than a popular character; and several college professors and others engaged in economic work have signified their intention to assist in its foundation.

— In the early part of 1884, Siemens brothers constructed an electric railway between Frankfort and Offenbach. The two rods conducting the current were suspended by insulators from poles; and from the top of the car, wires ran to these rods. The illustration which we reproduce from *La lumière électrique* for Jan. 24 shows the arrangement at a crossing. The length of the line was 6,555 metres, and there were employed upon it four cars: the tension was 600 volts, and the efficiency from 50 to 80 per cent, according to the position of the cars.

— The sixth international congress of Americanists, which was to have met during the present month at Turin, is postponed to September, 1886, on account of the ravages of cholera in Spain, which would deprive the congress of the presence of Spanish Americanists.

— The first part of an encyclopedic dictionary in Bengali, edited by two native scholars, has just been published in India. It contains descriptive deriva-

tions of Sanscrit and Bengali words, with Sutras quoted from Panini the grammarian; Arabic, Persian, and Hindi words introduced into the Bengali language; notes on the ancient and modern religious beliefs of India, the Vedas, Purans, Tantras, and other sacred books; besides short articles embracing the whole range of modern science.

— The Ohio state university has instituted a 'short course' in agriculture to obviate the objection sometimes made, that the full course of four years required more time than the young farmer could afford. The new course covers two years. For admission to the lowest grade of studies in this course, examination

will be required in arithmetic, English grammar, and geography; but those wishing to enter the classes in algebra, geometry, or physics, must also pass an examination in algebra. The course of study includes agricultural chemistry, botany, agriculture, horticulture, veterinary science, mathematics, physiology, physics, physical geography, and 'mechanical laboratory.'

A short course in agriculture has also been instituted by the university of Wisconsin, in the hope of attracting those who can devote only a small amount of time or money to these studies. The course is a strictly technical one, consisting of courses of illustrated lectures upon agriculture, agricultural chemistry,

agricultural botany, and veterinary science. It extends over the twelve weeks of the winter term, and is designed to be very elementary and 'popular.'

— According to the latest returns of the English consul at Teheran, the population of Persia, which covers an area of 1,647,000 square kilometres, amounts to 7,653,000. Of 99 cities with a total population of 1,963,800 inhabitants, Teheran has 120,000; Tabris, 164,000; Ispahan, 70,000; Bushir, 60,000; Meshed, 60,000; Kerman, 71,000; Resht, 40,000; Jezd, 40,000; and Shiraz, Kirmashah, Hamadan, and Kashan, each 30,000.

